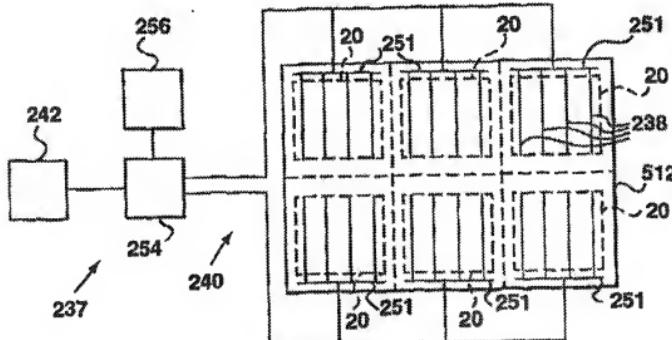




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : C02F 3/12, 1/44, 3/20, B01D 65/02	A1	(11) International Publication Number: WO 00/21890 (43) International Publication Date: 20 April 2000 (20.04.00)
(21) International Application Number: PCT/CA99/00940		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 7 October 1999 (07.10.99)		
(30) Priority Data: 60/103,665 9 October 1998 (09.10.98) US 2,258,715 14 January 1999 (14.01.99) CA 60/16,591 20 January 1999 (20.01.99) US 2,278,085 20 July 1999 (20.07.99) CA 2,279,766 30 July 1999 (30.07.99) CA		
(71) Applicant (<i>for all designated States except US</i>): ZENON ENVIRONMENTAL INC. [CA/CA]; 845 Harrington Court, Burlington, Ontario L7N 3P3 (CA).		Published With international search report. With amended claims.
(72) Inventors; and (75) Inventors/Applicants (<i>for US only</i>): COTE, Pierre [CA/CA]; 26 Tally-Ho Drive, Dundas, Ontario L9R 3M6 (CA). JANSON, Arnold [CA/CA]; 343 Rankin Drive, Burlington, Ontario L7N 2B2 (CA). RARIE, Hamid IIR/CA); Unit 33, 2665 Thomas Street, Mississauga, Ontario L5M 6G4 (CA). SINGH, Manwinder [IN/CA]; 1460 Ghent Avenue, Burlington, Ontario L7S 1X7 (CA).		
(74) Agent: BERESKIN & PARR; 40th floor, 40 King Street West, Toronto, Ontario M5H 3Y2 (CA).		

(54) Title: CYCLIC AERATION SYSTEM FOR SUBMERGED MEMBRANE MODULES



(57) Abstract

An aeration system for a submerged membrane module has a set of aerators connected to an air blower, valves and a controller adapted to alternately provide a higher rate of air flow and a lower rate of air flow in repeated cycles. In an embodiment, the air blower, valves and controller, simultaneously provide the alternating air flow to two or more sets of aerators such that the total air flow is constant, allowing the blower to be operated at a constant speed. In another embodiment, the repeated cycles are of short duration. Transient flow conditions result in the tank water which helps avoid dead spaces and assists in agitating the membranes.